Remarks

Claim Status

Claims 1-91 were originally presented for examination in this application. In a preliminary amendment filed on May 14, 2004, Applicants cancelled claims 41-91. A restriction requirement was issued on February 14, 2006, and Applicants elected claims 26-40 in response thereto. An Office Action was issued on April 7, 2006, rejecting claims 26-40. In response, Applicants submitted an Amendment and Response on July 5, 2006, in which claims 26 and 34-37 were amended and new claims 92-106 were added. A Final Office Action was issued on October 23, 2006, in which:

- Claims 26-40 and 92-106 were rejected as unpatentable under 35 U.S.C. §101 as being directed to non-statutory subject matter. Applicants have amended the claims to in such a manner as to describe tangible embodiments of the invention, and therefore request the withdrawal of these rejections.

- Claims 92, 98-100 and 106 were rejected under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant's regard as the invention. Applicants have amended claims 92 and 98-100 to in such a manner as to remove the basis for this indefiniteness rejection, and therefore request the withdrawal of these rejections. Applicant's believe Examiner's rejection of claim 106 was in error (see antecedent basis in claim 105), and request the withdrawal of this rejection.

- Claims 26-39, 92-95, 97 and 101-106 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Publication No. 2002/0087275 to Kim et al. ("Kim").

- Claims 40 and 96 were rejected under 35 U.S.C. §103(a) as being obvious in light of Kim in view of U.S. Patent Publication No. 2002/0198858 to Stanley et al. ("Stanley").

In this response, Applicants have amended claims 26, 37, 98, 99 and 101 to address these rejections and to further clarify and describe the invention with greater particularity. Support for

these amendments can be found at least at paragraphs [0067] – [0072] and [0173]. No new matter has been added. Claim 37 has been amended to correct a minor typographical error.

Information Disclosure Statements

Applicants thank the Examiner for considering the references cited in the previously filed Information Disclosure Statements. In addition, Applicants submit herewith an Eighth Supplemental Information Disclosure Statement and requests that the references included therein be considered prior to any subsequent Office Actions.

Claim Rejections Under 35 U.S.C. 102(e)

Claim 26

Independent claim 26, as amended, includes an inference engine for translating the data into a form compatible with the database, selecting a case frame as a template to represent new data to be added to a database, assigning elements of the new data to previously unspecified object identifiers within the case frame and assuring the case frame conform to a life science ontology. As a result, new life science assertions are created in a database that are consistent with the ontology. This element is absent from the cited art.

Briefly, Kim describes a method for representing molecular biological relationships using graphical tools. Kim, para. [0035]. More specifically, Kim's techniques provide two principle features, namely, (i) the implementation of relational graphing objects that can be stored in a database, and (ii) implementation of operators for computing resultant graphs. Kim, paras. [0035] and [0037]. These operators are then used as a tool to analyze genomic relations. Kim, para. [0046]. Although Kim does discuss "representation of heterogeneous molecular biological data" which "can be captured in a single unified structure" (Kim, para. [0041]), Kim does not teach or suggest translating data from one format to another or selecting from a plurality of case frames for use as templates to represent the addition of new data. Instead, Kim relies on one of two methods for creating data in the database, neither of which utilize the claimed case frame approach. First, Kim details a series of steps for creating individual vertices and edges that represent yeast genes. Kim, paras. [0080] - [0100]. Second, Kim describes combining gene expression data and gene ontology data using a graphical operation that "synthesizes information

from two or more graphs by finding the subset of common edges and vertices" Kim, para. [0304]. Such an approach assumes, and in fact is expressly dependent upon, the data being combined be provided in the prescribed graphical format. Kim fails to teach or suggest any technique for translating data from external sources into a form compatible with the database or using the translated data to create new life science assertions that conform to a life science ontology.

The presented claims, as amended, go well beyond what is disclosed in Kim. In addition to a database of biorelationships, Applicants' invention provides case frames that can be used as templates for the introduction of new data into the data base. As a result, an inference engine can add new data into the database by assigning elements of the new data to instantiations of the case frames, and thus creating new life science assertions in the database that conform to a specified life science ontology. In doing so, Applicants' invention facilitates an automated and rapid expansion of the database in a manner that is beyond the manual means of creating vertices and edges and does not require the data be presented in a prescribed graphical format as described by Kim. Using this data assertion process, the Assignee has, as of this date, built a database comprising millions of assertions, using only a handful of curators to do so.

Moreover, Stanley does not cure the discrepancies of Kim. Briefly, Stanley describes a software architecture that represents data records using "Intelligent Molecular Objects" (IMOs), which provide a means for querying heterogeneous data sets using a common interface. Stanley does not contemplate using pre-existing case frames and a life science ontology to govern the introduction of new data into biological knowledge base.

Thus, because neither Kim nor Stanley teaches or suggests every element of independent claim 26 as amended, Applicants respectfully submit that these references, alone or in combination, fail to anticipate these claims or render the claims as obvious. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claim 26 under 35 U.S.C. §102(e), as well as those claims that depend directly or indirectly therefrom.

Independent Claim 101

Independent claim 101 as amended recites, in part, an electronic database for storing a plurality of case frames representing enzyme reactions, binding interactions, modifications of polymers, protein phosphorylation reactions, gene expressions, acetylation, peptide-bond cleavage, glycosylayion, lipidation, methylation, metallation, cross-linking, hydroxylation, sulfation ADP-ribosylation, translocation and transcriptional activations. Neither the database described in Kim, nor the software objects described by Stanley model all of these biological functions.

Thus, because neither Kim nor Stanley teaches or suggests every element of independent claim 101 as amended, Applicants respectfully submit that these references, alone or in combination, fail to anticipate these claims or render the claims as obvious. Accordingly, Applicants respectfully request that claim 101, as well as those claims that depend directly or indirectly therefrom, be allowed.

Conclusion

Applicants respectfully submit that, in light of the foregoing amendments and remarks, claims 26-40 and 92-106 are in condition for allowance, and requests that application proceed to issue. If, in the Examiner's opinion, a telephonic interview would expedite the favorable prosecution of the present application, the undersigned attorney would welcome the opportunity to discuss any outstanding issues and to work with the Examiner toward placing the application in condition for allowance.

Respectfully submitted,

Date: February 28, 2007

Joel E. Lehrer, Reg. No. 56,401
Attorney for Applicants
Goodwin | Procter LLP
Exchange Place
53 State Street
Boston, Massachusetts 02109

Tel. No.: (617) 570-1057
Fax No.: (617) 523-1231